

Attorney's Docket No. K&A 23-0355
Client's Docket No. 13445

APPLICATION

FOR UNITED STATES LETTERS PATENT

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN THAT I, **GEORGE BENESH**, a citizen of
UNITED STATES OF AMERICA, have invented a new and useful
ALCOHOL AND DRUG SENSOR SYSTEM FOR VEHICLES of
which the following is a specification:

ALCOHOL AND DRUG SENSOR SYSTEM FOR VEHICLES

5 CROSS REFERENCE TO RELATED APPLICATION

This application claims the benefit of U.S. Provisional Application No. 60/411,580, filed September 18, 2002.

10 BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to sensors and more particularly
15 pertains to a new alcohol and drug sensor for vehicles for preventing ignition of a vehicle engine by an intoxicated driver.

Description of the Prior Art

20 The use of sensors for preventing intoxicated operation of a vehicle is known in the prior art. U.S. Patent No. 5,743,349 describes a system for non-invasive measuring of blood alcohol using optical spectroscopic electromagnetic radiation. Another type of sensor used in restricting vehicle operation is U.S. Patent
25 No. 5,969,615 having a plurality of passageways positioned adjacent to the hand position of the driver to sample vapor emitted from the hands of the driver. U.S. Patent No. 6,167,746 discloses an alcohol concentration sensing system that uses breath pressure measurement to control the volume of breath analyzed.

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While these devices fulfill their respective, particular objectives and requirements, the need remains for a system that

incorporates gas chromatography into the analysis of breath and processes the collected information to selectively activate a vehicle ignition system when the breath of the potential driver does not contain threshold levels of intoxicants.

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SUMMARY OF THE INVENTION

The present invention generally comprises a gas chromatograph sensor operationally coupled to a sample collection
10 tube. The sensor is operationally coupled to a microprocessor that prevents the ignition system of the vehicle from working until a breath sample is collected and the intoxicant content of the breath sample is determined to be below a pre-determined level.

15 There has thus been outlined, rather broadly, the more important features of the invention in order that the detailed description thereof that follows may be better understood, and in order that the present contribution to the art may be better appreciated. There are additional features of the invention that
20 will be described hereinafter and which will form the subject matter of the claims appended hereto.

The objects of the invention, along with the various features of novelty which characterize the invention, are pointed out with
25 particularity in the claims annexed to and forming a part of this disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

30 The invention will be better understood and objects other than those set forth above will become apparent when consideration is

given to the following detailed description thereof. Such description makes reference to the annexed drawings wherein:

Figure 1 is a schematic front view of a new alcohol and drug
5 sensor system for vehicles according to the present invention.

Figure 2 is a perspective view of the present invention.

Figure 3 is a representational side view of the silicon wafer
10 thermal detectors and wheatstone bridge assembly of the sensor of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

15 With reference now to the drawings, and in particular to Figures 1 through 3 thereof, a new alcohol and drug sensor system for vehicles embodying the principles and concepts of the present invention and generally designated by the reference numeral 10 will be described.

20 As illustrated in Figures 1 through 3, the alcohol and drug sensor system for vehicles 10 generally comprises a main tube 12 extending from the dashboard 2 of a vehicle 4 or other structure near to the potential driver of the vehicle 4 such as the vehicle's
25 frame, floor, seat or the like. The main tube 12 is connected to a sensor 14 for detecting the presence of intoxicants in the breath of a person blowing into the main tube 12. The sensor 14 is operationally coupled to a microprocessor 16. The ignition system 18 of the vehicle 4 is operationally coupled to the microprocessor
30 16 such that the ignition system 18 cannot be activated until a potential driver has blown into the main tube 12. If a level of intoxicants detected by the sensor 14 is over a pre-determined

level, the microprocessor 16 will not activate the ignition system 18, thus preventing the vehicle 4 from being driven. If the level of intoxicants is below the pre-determined level, the microprocessor 16 activates a relay 20 to enable the ignition system 18 to permit
5 the ignition system 18 to be used to start the engine of the vehicle 4. Most preferably, the microprocessor 16 is operationally coupled to a locking means 24 for physically preventing turning of an ignition key 26. The means 24 may be a conventionally known physical lock such as a solenoid 28 engaging the ignition key
10 assembly 30 to prevent rotation of the ignition key 26.

The sensor 14 uses gas chromatography. The components of the sensor 14 are a carrier-gas supply and flow controller 32, a sample inlet tube 34, a chromatographic column 36, and a column
15 oven 38. A breath sample is injected into the sample inlet tube 34 when the potential driver blows into the main tube 12. The sample is channeled into the column oven 38 to heat the sample. The elements of the breath sample are then distinguished using the retention time within the column 36. The sample leaves the column
20 36 through a hole 40 in the center 42 of a silicone wafer 44. Two thermal detectors 46 utilizing serpentine strands 48 of nickel wire with very low resistance are positioned near the hole 40 in the silicone wafer 44. The strands 48 of nickel wire are approximately 20 microns thick and one inch long. A wheatstone bridge 50 is
25 attached to the detectors 46. When the elements of the breath sample pass through the hole 40, the resistance between the detectors 46 is measured. The changes in resistance are then used to determine the contents of the breath sample.

In use, the potential driver of the vehicle must blow into the main tube and wait briefly for the gas chromatograph analysis and subsequent activation of the ignition system of the vehicle.

5 With respect to the above description then, it is to be realized that the optimum dimensional relationships for the parts of the invention, to include variations in size, materials, shape, form, function and manner of operation, assembly and use, are deemed readily apparent and obvious to one skilled in the art, and all
10 equivalent relationships to those illustrated in the drawings and described in the specification are intended to be encompassed by the present invention.

 Therefore, the foregoing is considered as illustrative only of
15 the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the
20 scope of the invention.